

Biomonitoring Data Sources and Applications in the New Mexico Tracking Program

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Rocky Mountain Biomonitoring Consortium (RMBC)



New Mexico Biomonitoring Data Sources

- CDC Biomonitoring Program - Rocky Mountain Biomonitoring Consortium (RMBC)
- Chemical Terrorism/Preparedness Collaborations
- Notifiable Conditions
- Western States Tracking and Biomonitoring Collaborative

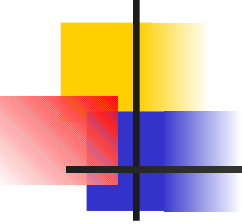


Rocky Mountain Biomonitoring Consortium

- Montana, Wyoming, Utah, Colorado, Arizona, and New Mexico
- CDC Funded Five-Year Implementation followed Two-Year Planning Grant
- Currently in Year 4
- Substantial reduction in program funding
- Increased collaboration with CT preparedness

RMBC Studies

- Urine and drinking water for arsenic and metals
- Infant Bloodspots methods development and analysis for lead and mercury
- Phthalate metabolites analysis in urine
- Chemical terrorism baselines of interest – thiodiglycol, organophosphate metabolites
- Arsenic speciation in urine
- Arsenic levels and Type 2 Diabetes archived samples from case-control study
- Mercury in hair? Cotinine in urine?



BIOMONITORING OVERVIEW

New Mexico Drinking Water and Urinary Arsenic Exposure Assessment

- Conducting exposure assessment of arsenic and metals in drinking water and urine
- Collection and analysis completed for more than 500 paired drinking water and urine samples with exposure questionnaires
- Plan to collect and analyze 1000 samples
- Samples to be used to validate EPHT exposure assumptions
- Regional samples also being collected across the RMBC (AZ, CO, MT, NM, UT, WY)

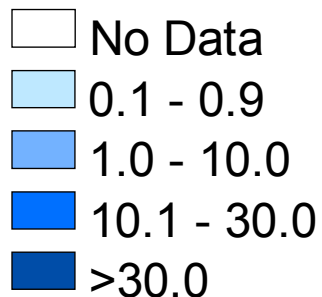


BIOMONITORING RECRUITMENT AND COMMUNICATION OF RESULTS

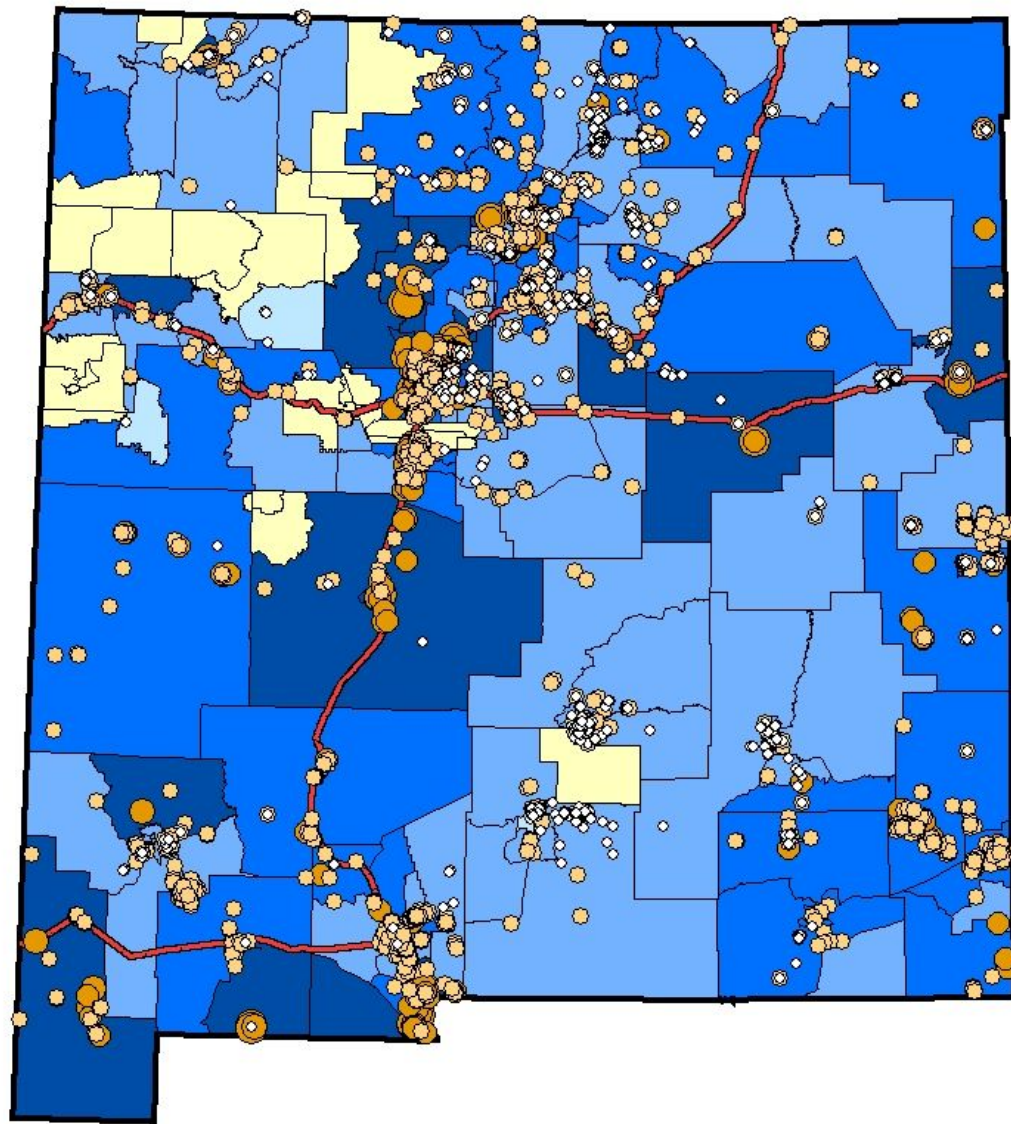
- Conducting exposure assessment of arsenic and metals in drinking water and urine
- Volunteer recruitment of adults primarily from press releases and flyers
- IRB Approval
- Individual results provided to participants
- Drinking Water Data compared to health based screening levels and MCLs
- Urine data compared to population values
- Advisement if appropriate

Geographic Distribution of New Mexico Census Tracts According to Drinking Water Arsenic

Tract Arsenic (ppb)

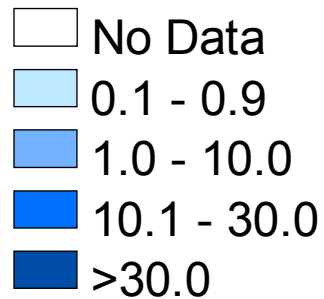


Arsenic (ppb)

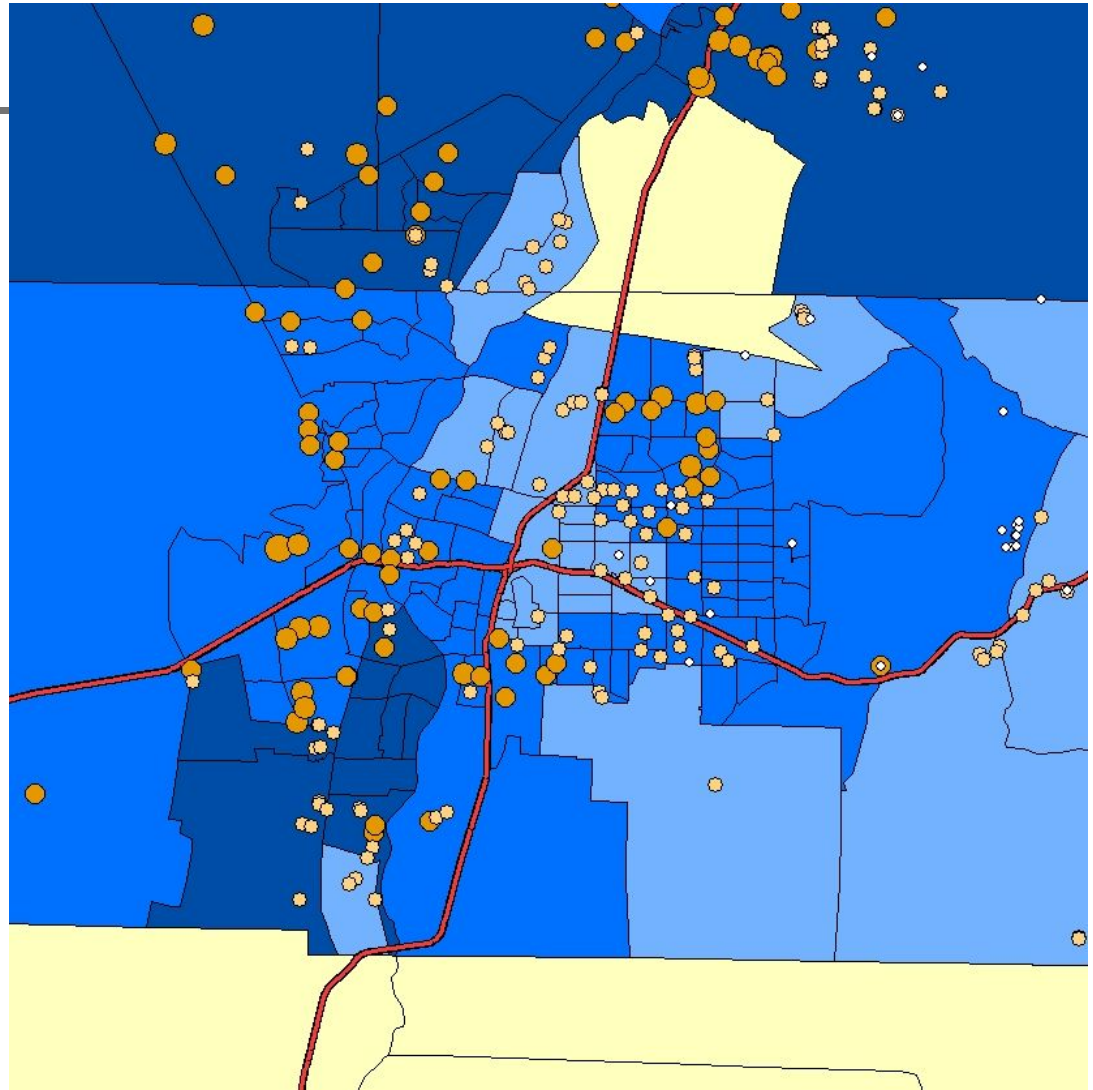
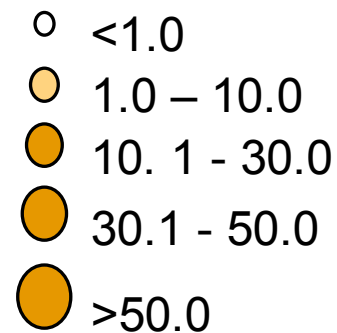


Geographic Distribution of Albuquerque Census Tracts According to Drinking Water Arsenic

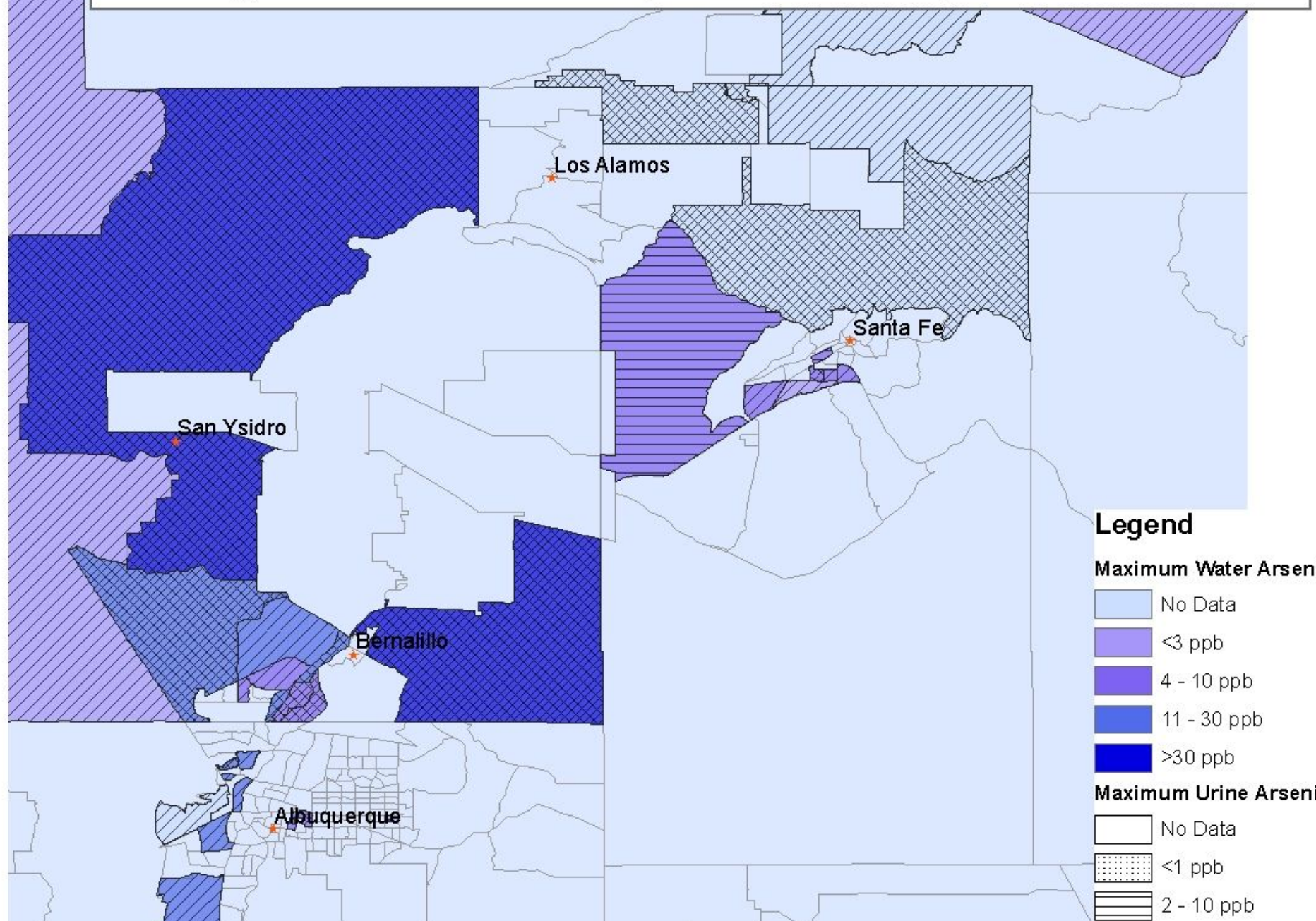
Tract Arsenic (ppb)



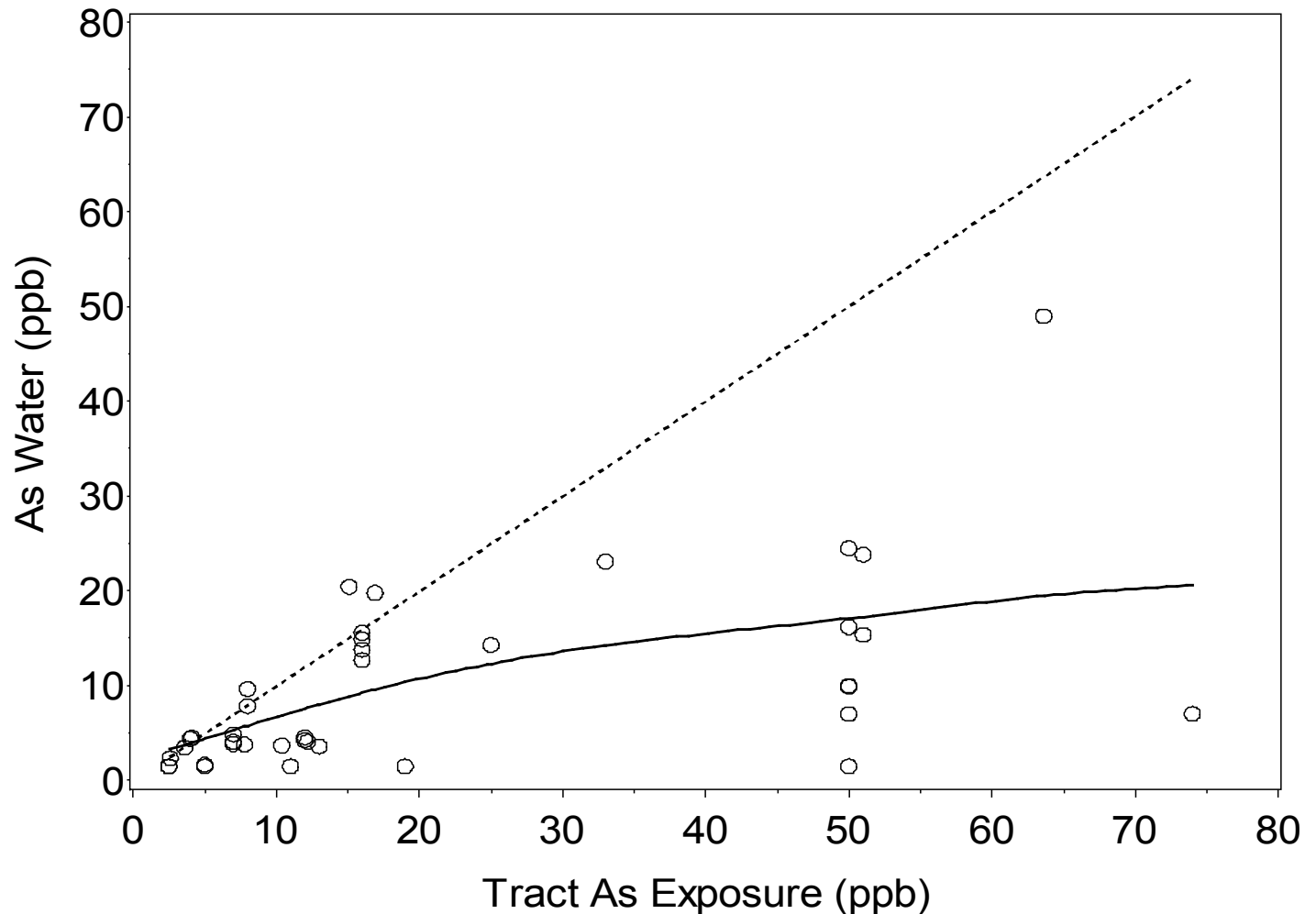
Arsenic (ppb)



Drinking Water & Urine Samples for Arsenic, North Central NM



Comparison of Arsenic Levels in Drinking Water Samples and Census Tract Estimations from Compliance Data





Preliminary Review of Arsenic Biomonitoring Results

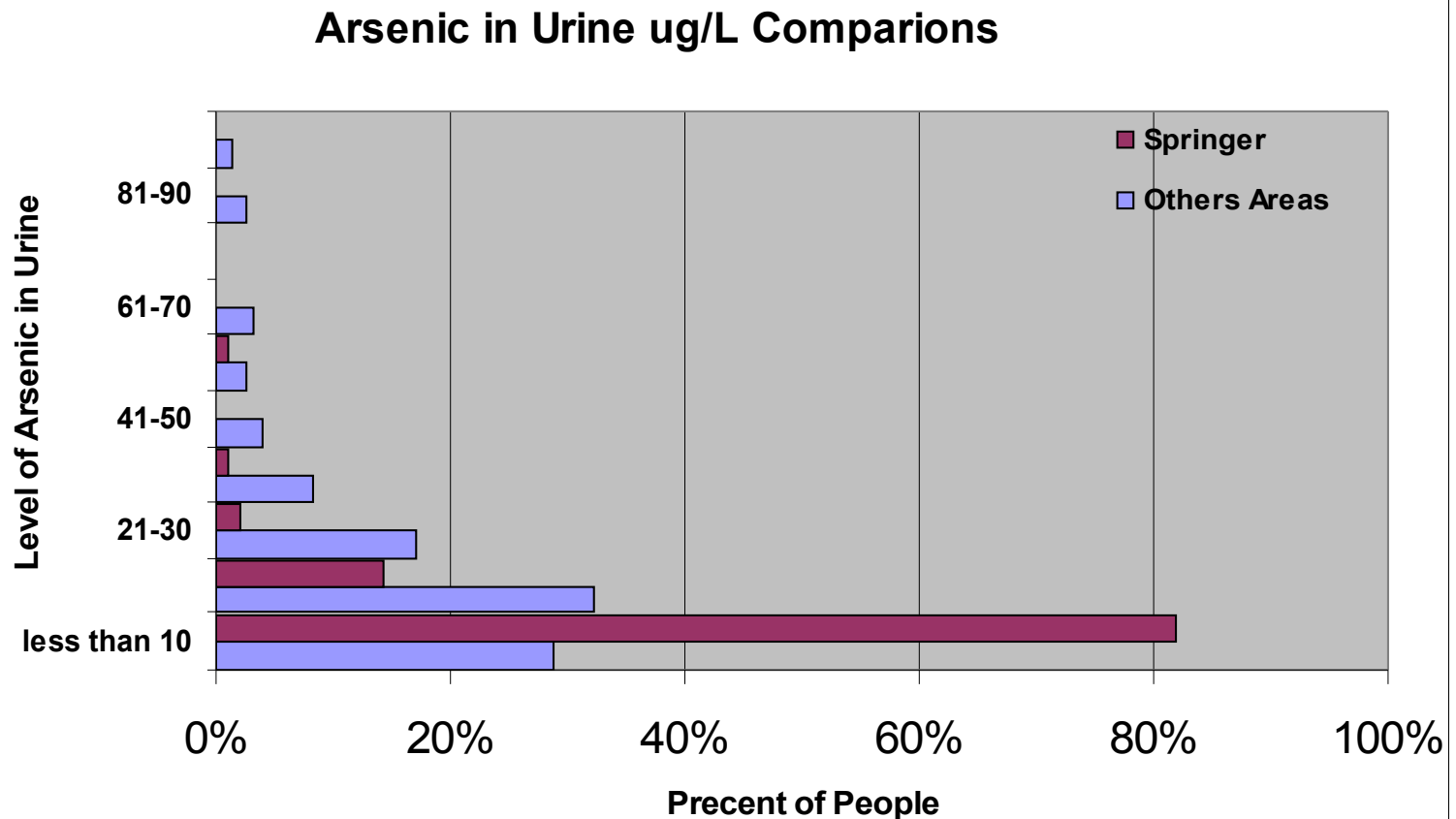
- Household drinking water samples generally correlate well with drinking water exposure concentrations estimated from SDWIS compliance database for most census tracts, although many require adjustment
- Drinking water concentrations do not correlate well with urine due to influence of dietary exposure:
 - 14% urine samples >50 ug As/L urine
 - Of these, 95% consumed fish/seafood/fish oil
 - Remaining 5% chewed tobacco



Springer Arsenic Study

- Arsenic appeared elevated in urine in 7/11 residents based on a clinical lab result using a reference range of 0 – 50 ug/d
- Additional urine samples and exposure questionnaires were collected and analyzed for arsenic in 99 Springer residents
- NMDOH and CDC use ug/L value of up to 50 ug/L as normal without seafood ingestion
- All the 11 lab results are below this value
- 98/99 results were also below this level

Arsenic Levels in New Mexico Urine Samples





New Mexico Risk Factors for Elevated Arsenic in Urine

- Fish or Seafood ingestion – 80% increase in urinary arsenic
- Tobacco use – 18% increase in urinary arsenic
- Elevated arsenic in drinking water – depends on concentration
- Beer consumption – 39% decrease in urinary arsenic

Other Urine Metals Results

Metal	NM 95% Level	NHANES 95% level
Antimony	0.34	0.34
Arsenic	80	
Cadmium	1.3	1.2
Chromium	2.01	
Copper	92.3	
Lead	2.72	2.6
Manganese	1.94	
Mercury	2	3.99
Molybdenum	216	165
Selenium	143	
Tungsten	1.5	0.45
Uranium	0.11	0.046
Vanadium	32.8	
Zinc	1478	



Other Metals Results from Urine and Drinking Water Study

- Uranium detected in private wells at levels
> 20 x MCL
- Uranium in urine significantly elevated
statewide over NHANES values
- High urinary values for molybdenum in people
taking vitamin/mineral supplements
- Low urinary values for mercury no apparent
correlation with dental amalgam +/-



New Mexico Notifiable Conditions

- Blood lead levels all blood levels
- Mercury in blood > 5 ug/L
- Mercury in urine >3 ug/L
- Arsenic in urine >50 ug/L
- Acetylcholinesterase all blood levels
- All pesticide poisoning
- Methemoglobinemia

HIV: (1) confirmed positive HIV antibody test (screening test plus confirmatory test), or (2) any test for HIV RNA or HIV cDNA ('viral load'), or (3) any test to detect HIV proteins, or (4) any positive HIV culture, or (5) any other test or condition indicative of HIV infection as defined by the United States Centers for Disease Control and Prevention.

AIDS: Opportunistic infections, cancers, CD4 lymphocyte count (<200 per μL or $<14\%$ of total lymphocytes), or any condition indicative of AIDS.

Occupational Illness and Injury

Report to New Mexico Occupational Health Registry, MSC 105550, 1 University of New Mexico, Albuquerque, NM 87131-0001.

Asbestosis
Chronic beryllium lung disease
Coal worker's pneumoconiosis
Heavy metal poisoning

Hypersensitivity pneumonitis
Mesothelioma
Noise induced hearing loss
Occupational asthma

Occupational pesticide poisoning
Silicosis
Other illnesses related to occupational exposure

Health Conditions Related to Environmental Exposures and Certain Injuries

Report to Epidemiology and Response Division, NM Department of Health, P.O. Box 26110, Santa Fe, NM 87502-6110; or call 1-800-432-4404 or 505-827-0006.

Environmental Exposures

Acetylcholinesterase (all blood levels)
All pesticide poisoning
Arsenic in urine greater than 50 micrograms/liter
Infant methemoglobinemia

Lead (all blood levels)
Mercury in urine greater than 3 micrograms/liter and/or
Mercury in blood greater than 5 micrograms/liter
Other suspected environmentally-induced health conditions

Select Injuries

Drug overdose
Firearm injuries

Spinal cord injuries
Traumatic brain injuries

Adverse Vaccine Reactions

Report to Vaccine Adverse Events Reporting System, <http://www.vaers.hhs.org>. Send copy of report to Immunization Program Vaccine Manager, NM Department of Health, P.O. Box 26110, Santa Fe, NM 87502-6110; fax 505-827-1741.

Cancer

Report to New Mexico Tumor Registry, University of New Mexico School of Medicine, Albuquerque, NM 87131. Report all malignant and in situ neoplasms and all intracranial neoplasms, regardless of the tissue of origin.

Human Papillomavirus (HPV)

Laboratories report the following tests to the New Mexico HPV Pap Registry, 1816 Sigma Chi Rd NE, Albuquerque, NM 87131, phone (505) 272-5785 or (505) 277-0266.

Papanicolaou test results (all results)
Cervical pathology results (all results)
HPV test results (all results)

Birth Defects and Congenital Hearing Loss

Report to Children's Medical Services, 2040 S. Pacheco, Santa Fe, NM 87505; or call 505-476-8868.

All birth defects diagnosed by age 4 years, including:

Defects diagnosed during pregnancy
Defects diagnosed on fetal deaths

Suspected or confirmed congenital hearing loss in one or both ears

All conditions identified through statewide newborn genetic screening

For details online of 7.4.3.13 NMAC see: <http://www.nmcpr.state.nm.us/nmac/parts/title07/07.004.0003.htm>

Western States Tracking and Biomonitoring Collaborative

